

1518 SPS Over Expression in Cotton and its Effect on Lint Yield and Fiber Quality

Dr. Jodi A. Scheffler , USDA-ARS, Stoneville, MS
Ms. E. Margaret Shields , Bayer Crop Science, Lubbock, TX
Dr. Bir Singh , North Carolina State University, Raleigh, NC
Dr. A. Scott Holaday , Texas Tech University, Lubbock, TX
Dr. John R. Gannaway , Texas Agricultural Experiment Station, Lubbock, TX
Dr. Candace H. Haigler , North Carolina State University, Raleigh, NC

Biochemical analyses of leaf (source) and fiber (sink) metabolism indicated that increasing sucrose phosphate synthase (SPS) activity might increase lint yields and improve fiber quality. To test this hypothesis, cotton (*Gossypium hirsutum* L., cv Coker 312) was transformed with the spinach SPS gene under the control of the CaMV 35S promoter. Transgenic plants were produced that expressed the gene and showed elevated levels of SPS activity. To test whether the SPS gene might improve fiber yield or quality, under field conditions, trials were conducted over two years at Stoneville, MS. The trial included transgenic plants expressing the gene and not expressing the gene, with Coker 312 and six commercial cultivars as checks. The plots were evaluated for percent germination, flowering time, nodes above last boll, lint percent, cottonseed weight and 100 seed weight. Fiber samples were analyzed by HVI, AFIS, Fibrograph and Arealometer. The one transgenic line with the highest leaf and fiber SPS activity showed an increase in fiber strength over its transformation progenitor Coker 312.